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OIL TALK

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A review of: Tim Mitchell, *Carbon Democracy: Political Power in the Age of Oil*, London: Verso, 2011 and David Victor, David Hults and Mark Thurber (editors), *Oil and Governance: State-Owned Enterprises and the World Energy Supply*. London: Cambridge University Press, 2012.

> When the drill bored down toward the stony fissures
> and plunged its implacable intestine
> into the subterranean estates,
> and dead years, eyes of the ages,
> imprisoned plants' roots
> and scaly systems
> became strata of water,
> fire shot up through the tubes
> transformed into cold liquid,
> in the customs house of the heights,
> issuing from its world of sinister depth,
> it encountered a pale engineer
> and a title deed.
>
> Pablo Neruda, 'Standard Oil Co.' *Canto General,* 1940

Entering the house of Big Oil is an unsettling experience, not least because of the overwhelming sense of intellectual vertigo it produces. There is, of course, the secrecy, guardedness, ventriloquism and defensiveness of the industry itself, but this is coupled with the extraordinary degree to which, in a world populated by technical expertise and scientific rigor – drilling in deepwater is like putting someone on the moon as the oil mavens like to say - there is a startling degree of inexactitude, studied ignorance and an often remarkable lack of reliable information in a vast sea of data. Why are the basic truths of the oil world - the mundane and banal questions of quantity, output and price - seemingly so vague, opaque and elastic? This epistemological murk – or more charitably epistemological complexity - is immediately evident when one poses a most basic questions of how much oil there actually is, and how much enters the market (the world of oil is saturated with declensionist language of futurity and decline: can we find enough, how long will it last?). Concern over the imminent (passing?) arrival of Hubbert's Peak has moved peak oil from the margins of the energy debate to its very center. Yet the radical disparities in the quantitative estimates of oil – primary and secondary proven reserves most obviously – and the unfathomable variance in official oil projections are

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[1] I am grateful to my colleague Arthur Mason for conjuring up the title oil talk as a way of encapsulating the now vast field of writing on oil and the discursive carbon world of which it is part. I also wish to thank Hannah Chadeayne Appel, another Berkeley colleague and oil aficionado for her constructive critique.

striking (for the record the US Energy Information Administration (EIA) has *twelve* different scenarios resulting in peak world crude oil production emerging between 2021 and 2112). The veracity of estimates of proven reserves - so-called booked reserves - was thrown into sharp relief in 2005 by Shell's admission of its cooking the numbers (in this case overestimating the reserves) in Nigeria and Australia as a way of capturing tax breaks. In any case, nobody in their right mind would take seriously the figures on reserves, or indeed output, provided by national oil companies like Saudi Aramco or PDVSA or indeed by OPEC. The industry is marked by what one consultant delicately referred to as a "lack of transparent data" (Moors 2011: 43). Notwithstanding the obvious finite nature of the resource - there are currently by one estimation 1.032 trillion barrels of proven crude reserves – the startling fact is that there is for every Malthusian credo of a King Hubbert there is a prominent doubter (what Timothy Mitchell in his important new book *Carbon Democracy* calls the cornucopian view (p.188)), like MIT's Morris Adelman for whom oil is inexhaustible. As regards basic oil output data, OPEC's quotas are regularly exceeded by margins that are impossible to estimate. OPEC members publish data three months late thereby maintain confusion between actual output and quotas, while operators and consultants track tankers in a game of hide and seek. While in theory all oil production is metered and registered (through chemical finger-printing one could trace any barrel of oil to its wellhead), vast quantities of stolen oil enter the global oil market every year (it has been estimated that over 10% of US imports might be stolen). The shadow oil industry – mafias, militias, illicit traders and refiners, speculators and swap dealers - is a phenomenon in and of itself. The public secret in the industry is any exactitude as regards these sorts of numbers is something of a joke. Mitchell begins and ends his book with this epistemological conundrum – the "practical work of calculation" as he calls it through which economics governs and society is separated from nature (p.247) – but it courses through the pages of *Oil and Governance* a massive new treatise on national oil companies (NOCs are "extremely difficult to study investigate" they say on page 13 of a 1000 page book).

What is true for quantity is true for price and for the operations of the oil 'market'. For the better part of a century, petroleum has been the energy source of industrial capitalism – the fuel of our high-energy economy and constitutive of our carbon democracy. Equivalent power commanded by today's affluent Euro-American household—without the convenience, versatility, flexibility, and reliability of delivered energy services—would have been available "only to Roman *latifundia* owner of 6000 slaves, or to a nineteenth-century landlord employing 3000 workers and 400 big draft horses" (Smil 2001: 48). It is often noted that American capitalism has been built around cheap oil in a global market whose historically defining characteristic is the management of surplus rather than scarcity. Yet the actual dynamics of price determination remain utterly confusing, mindboggling in their irrationality and unpredictability. Oil says Kent Moors (2011), "does not respond as most other goods do to market factors….To date there has yet to emerge a consistent theory…fully explaining how oil prices operate" (p.43). A market that has been historically dominated by a transnational corporate oligopoly (the Seven Sisters), a Third World cartel (OPEC), a First World consumer lobby (the International energy Agency) and long-term contracts, is not so much an example of rational irrationality – rational self-interest leading to socially irrational outcomes - as anti-market madness. Arguably the oil market remains the most powerful exemplar of how relations between demand, supply and price cease to operate in any predictable fashion and are not related in any determinate way to price. In 2004, as once again global supplies exceeded demand and as oil prices hit new highs, the industry organ *Oil Market Intelligence* concluded - and they should know - that the traditional market signposts were of little use in explaining a "contradiction" which pointed to "the complexity and multi-faceted nature of the upward oil price 'shock' " (2004: 16). Four years later in the run up to $147.00 a barrel in 2008, Lehman Brothers - yes Lehman Brothers! – concluded it was an asset bubble, "petromania", (O'Sullivan 2009) what they cleverly called "Oil dotcom". There is no single theoretical discipline in the social sciences, say Oystein Noreng, that "has been successful in analyzing the energy markets" (2002:8). Standing at the centre of neoliberal capitalism is a commodity and a market for which the terms market rationality or market fundamentals - let alone a neoliberal or free-market - seem utterly irrelevant to the operations of what passes as the oil and gas global value chain. No wonder each year sees the release of another raft of new academic books on the oil and gas complex suggesting a new road map to make sense of it all.

The sense of vertigo, of struggling to find solid footing, is further enhanced as one enters further into the cosmos of contemporary petro-capitalism, and the two books under view – wildly different in their intellectual apparatuses and yet strangely complementary and both fully committed to Mitchell's call for taking seriously "the ways oil is extracted, processed, shipped and consumed" (p.2) - intend to help us regain our footing. Let's start with the source of big in Big Oil. The vertically integrated private international oil companies – the seven' super-majors' (Exxon, BP, Shell, Chevron, ConocoPhillips, Total, ENI) – are of course among the largest and most profitable of transnational corporations, but their position in the global value chain is very different from the 1950's when the Seven Sisters dominated the concessional economy (then accounting for 92% of all reserves, compared to 5% currently). Over half of the top fifty oil and gas companies by output are national oil companies (NOCs) and they dominate reserve holdings (three quarters of all oil reserves are held by the ten largest NOCs – Exxon ranks 14th with 1% of the global total). The largest four NOCs' market capitalization is almost three times that of the top four private oil companies (Exxon, BP, Shell, Chevron); the top 4 NOCs by production and reserves exceed that of the top four supermajors by a factor of two and twenty respectively. Saudi Aramco alone generates over 10% of all global oil revenues; companies like SINOPEC and Lukoil are fully vertically integrated while China's CNPC in a fully globalised company, operating in 25 countries. These so-called 'new seven sisters' – the nationalized oil companies and frequently their sovereign wealth funds – are both hugely important in but also not coextensive with OPEC (Russian, Chinese, Brazilian and all of the Caspian producers are conspicuously not members). *Oil and Governance* – the result of a fascinating Stanford University study of this perplexing world of the national oil company from Norway to Nigeria – takes on this brave new world.

Mitchell begins his analysis with a powerful critique of much of what passes as the normal social science of the oil business, most especially the gargantuan output – both analytical and policy-oriented – on oil-states and the resource curse. He properly says that many of those who write about oil typically, and rather curiously, have little to say about the materiality of oil and the political economy of an unthinkably vast and complex industry. Often, he says, oil is simply an affliction of governments who deploy petro-dollars, neglecting "the processes by which a wider world obtains the energy that drives its materials and technical life" (p.2) and the apparatuses by which oil is converted into forms of affluence and influence. This is, in my view, quite right. It is striking for example in the analysis of the resource curse or oil-dependency and violence (a la Paul Collier (2007)), almost nothing is said about the agency of oil corporations, oil service companies, engineering houses or big finance. And yet I wonder whether even Mitchell himself has fully come to terms with the scale and the scope of what I have called the oil assemblage[2].

A key starting point is to see oil and gas as a global production network with particular properties, actors, networks, governance structures, institutions and organizations (a global value chain in the industry argot) but also as a complex regime of accumulation and a mode of regulation (see Noreng 2006; Roberts 2005). Seen in this way oil and gas is staggeringly vast on all counts. The value of the recoverable oil and gas is perhaps $160 trillion (more than the value of all equity markets and equal to the total value of all tradable financial assets); the value of the oil and gas market alone is over US$3 trillion. Assets of the entire industry now total over US$40 trillion. Close to 70% of all oil produced is traded (over 50 million barrels per day) accounting for the largest component in world trade. Not unusually, over 1 billion barrels of oil can be traded in a day on the New York Mercantile Exchange and the InterContinental Exchange, much of this being 'paper oil' (never delivered physically as oil), which is to say part of the booming commodities futures market. The largest oil companies (private and nationalized) market value exceeds the GDP of all of Africa. The production network is held together materially by a global oil infrastructure with its own particular geography. Close to 5 million producing oil wells puncture the surface of the earth (77,000 were drilled last year, 4000 offshore); 3300 are subsea, puncturing the earth's crust on the continental shelf in some cases thousands of meters below the sea's surface. There are by some estimations over 40,000 oilfields in operation. More than 2 million kms of pipelines blanket the globe in a massive trunk-network (another 180,000 kms will be built at a capital cost of over $265 billion over the next four years); another 75,000 kms of lines transport oil and gas along the sea floor. There are 6000 fixed platforms, and 635 offshore drillings rigs (the international rig total for June 2011 is over 1158 according to Baker Hughes)[3]. 4295 oil tankers move 2.42 billion tons of oil and oil products every year - one third of global sea borne trade; over 80 massive floating, production and storage vessels have been installed in the last five years. This petro-infrastructure also accounts for almost 40% of global CO2 emissions. All in all there is nothing quite like it.

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[2] See Watts (2011). A new book by Philippe Le Billon and Gavin Bridge, *Oil.* London: Polity Press 2013 goes some way toward laying out and mapping this capacious landscape of oil and gas.

[3] More than 478 offshore platforms and 7,888 wells will require decommissioning in the period to 2041 that involves the removal of some four million tons of steel and other materials; the lowest cost estimate for this decommissioning according to Douglas-Westwood Associates is a staggering $65 billion.

Overlaid on the oil and gas network is an astonishing patchwork quilt of territorial concessions. Spatial technologies and spatial representations are foundational to the oil industry: seismic devices to map the contours of reservoirs, geographic information systems to monitor and meter the flows of products within pipeline, and of course the map to determine subterranean property rights. Hard rock geology is a science of the vertical but when harnessed to the market place and profitability it is the map which becomes the instrument of surveillance, control and rule. The oil and gas industry is a cartographers' dream: a landscape of lines, axes, hubs, spokes, nodes, points, blocks and flows. As a space of flows and connectivity, these spatial oil networks are unevenly visible (sub-surface, virtual) in their operations (Barry 2009, 2006). It's closest representation might be artists Mark Lomabrdi's extraordinary diagrams of financial and political fraud and corruption.

If oil is a vast assemblage or complex, what are its component parts? The variety of actors, agents and processes that give shape to our contemporary iteration of hydro-carbon capitalism is almost mind boggling: this is obviously the super majors, the national oil companies (NOCs) and the service companies and the massive oil infrastructure but also the petro states, the massive engineering companies and financial groups, the shadow economies (theft, money laundering, drugs, organized crime), the rafts of NGO's (human rights organizations, monitoring agencies, corporate social responsibility groups, voluntary regulatory agencies), the research institutes and lobbying groups, the landscape of oil consumption (from SUV's of pharmaceuticals), and not least the oil communities, the military and paramilitary groups, and the social movements which surround the operations of, and shape the functioning of, the oil industry narrowly construed. But this is only a start. The financial sector is key both in terms of project financing but also as oil itself becomes a financialized asset reflecting a radical change in the oil market itself in the last decade or so. This opens the door to securitization, speculation and the question of regulatory agencies and the lack thereof. These governance institutions include the commodity exchanges but also the newly emerging global governance mechanisms such as the International Energy Forum. And not least for every barrel of oil produced, moved, refined and consumed there are carbon emissions (and thereby carbon trading, carbon credits, offsets and carbon markets) which is itself a complex market with its own politics and dynamics.

This massive assemblage resembles, in some respects, what Andrew Barry (2006) has called a “technological zone”, a space within which “differences between technical practices, procedures or forms have been reduced, or common standards have been established” (2006:239). Barry sees such a zone as containing or producing different and multiple spaces (some of which have no boundaries as such) through the operations of metrological (measurement), infrastructural (connection) and qualificatory (assessment) standards. Similarly Mitchell – who cites Barry and draws upon the likes of Michel Callon and John Law - sees oil in terms of calls a coordinated but dispersed set of regulations, calculative arrangements, infrastructural and technical procedures that render certain objects or flows governable. Mitchell’s suggestion - to follow the complex materialities across oil infrastructural networks, across the worlds of engineering and title deeds, into the charnel houses of finance and the military to discover “how a particular set of relations was engineered among oil, violence, finance, expertise and democracy” (2009:428) - is surely right. As I think he would acknowledge, his book despite the enormous scope of what he takes on – hydrocarbons and democracy! – barely scratches the surface of the oil and gas complex.

Carbon Democracy can be situated in relation to three broad sorts of ways in which oil and modernity have been examined. One focuses on oil-producing states and, to quote the title of Michael Ross’s new book (2012), *How petroleum wealth shapes the development of nations.* In Ross’s dystopian account it is the scale, source, instability and secrecy of oil and the attendant rise of the so-called new seven sisters – the massive national oil companies of petro-states like Nigeria, Russia, Saudi Arabia and Iran – which explain the so-called paradox of plenty, namely the state pathologies and human developmental failures of oil-rich states (the ‘resource curse’, see Stiglitz and Sachs 2007). In his influential book *The Bottom Billion*, Oxford economist Paul Collier offers a version of this thesis in which oil-revenues are captured by rapacious political elites (‘the survival of the fattest’) thereby contributing to autocratic rule, and those revenues are also predated or looted by rebels for whom oil finances lead not so much emancipatory politics (social justice, self-determination) but organized crime conducted as rebellion and war (in Collier's account, greater oil-dependency produces an increased likelihood of civil war and violence). Oil here means oil *money* and oil politics means an *rents* captured by state agencies and the political class. The agency of oil corporations, or the oil service industries or financial institutions, for example, is almost entirely non-existent.

Another line of reasoning – Michael Klare's new book *The Race for What's Left* (2011) is an exemplary case – is almost entirely focused on 'Big Oil' and global geo-politics (what he has called the US global oil acquisition strategy). Here the driving logic resembles another form of commodity determinism this time with a robust Malthusian cast. Resources like oil are finite; industrial capitalism's enormous appetite for oil and gas, is now spurred on by extraordinary capitalist dynamism in South and East Asian economies – more than half of the oil consumed between 1860 and the present was accounted for in the three decades after 1980. Peak Oil in now upon us which necessarily amplifies the geo-political pressures and struggles precipitated by tight oil markets, slower rates of discovery and challenging operating environments (the 'end of cheap and easy oil' as the oil industry puts it). Precisely because of its strategic qualities, oil exploration and development has a praetorian cast, a frontier of violent accumulation working hand-in-hand with militarism and empire. Haunted by the spectre of depletion, states and corporations embark upon a desperate scramble for oil (and other natural resources as the new McKinsey report on the 'resource revolution' emphasizes which is leading inexorably to a tooth-and-claw struggle for both conventional and unconventional hydrocarbons (for example, the tar sands, shale gas, deepwater oil and gas). In this account we are about to enter a new 'thirty-years' war (Klare 2011a) for resources characterized by market volatility, ruthless resource grabs and a sort of military neo-liberalism. Here it is not so much oil as money as oil as post Cold War power politics (or oil as national security in the contemporary argot). What is on offer is a Big Oil-Big Military-Big Imperial State triumvirate. The invasion of Iraq in 2003 is, in this account, a sort of paradigmatic case[4].

Finally, there is the oil consumption side, or more properly the relations between oil and ways of life, most especially the post-1945 American way of life. Here the language – theoretical and empirical - is of a rather different register. Oil is capacious, central to virtually every aspect of our lives; as the *New York Times* put it, oil “oozes through your life” (2011) showing up in everything from asphalt to flavoring to drugs to plastics to fertilizers. Oil is capacious, the life blood of just about everything including, it turns out, the sorts of civic freedoms and political liberties that most Americans have come to take for granted: unlimited personal mobility, cheap food, the prospect of property ownership in the suburbs (Huber 2011). Oil underwrites modern life but the social cost is addiction (‘Drill, baby, drill”), the terrible costs of which are now clear: carbon emissions and global warming, the assumption of new technological and environmental risks as unconventional sources are exploited, and continued political dependency on parts of the world that, as Dick Cheney famously noted, do not have US interests at heart. In this rendering, oil is a form of biopower (Foucault 2003), a resource central to the life of populations and to the management of populations (Campbell 2005; Huber 2011). To deploy the language of Collier and Lakoff (2005: 22), oil actively constitutes a particular “regime of living” but also as Mitchell powerfully shows a regime of death.

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[4] For an argument against the 'blood for oil' thesis see RETORT (2005).

Inevitably oil figures into the social imaginary in powerful if contradictory sorts of ways. In the American oil imaginary, petroleum bubbles forth from a magical spigot . The great Polish journalist Ryzard Kapuscinski (1982) called oil a “fairy tale and like every fairy tale is a bit of a lie”. It is turned on and off, subject to, alas, the whim of Arab despots. Most Americans outside of the Gulf states were surprised to learn, in the wake of the Deepwater Horizon disaster, that oil and gas is pumped from 30,000 feet below the surface of the warm waters of the Gulf of Mexico. At the same time, the heroic figure of the oil entrepreneur or wildcatter – whether a Rockefeller or Texan wildcatter Rogers Lacey – co-exists with a deep cultural suspicion of the corrupting power of Big Oil. By the 1890’s the main elements of a popular dissenting tradition – in this case against Standard Oil - was already in place: the moral superiority of small business, the erosion of democracy and civic virtue by the concentration of wealth and power, and the corrupting influence of big business were its defining tropes. By the 1920’s, in the wake of anti-trust legislation, the emerging conservation movement (that is to say the Malthusian spectre of the scarcity of US oil) was co-extensive with a powerful ideology of the automobile as *the* symbol of American prosperity (between 1921 and 1930 the number of vehicles increased from 10.5 to 26.5 million). In short, popular suspicion lived comfortably with a series of expectations and normative claims about housing, mobility, food all of which derived from the power of the oil majors, backed up by the military might of the state (nowhere better expressed than in Churchill's claim in 1912 that " we must become the owners…….at the source of at least a proportion of the oil we require").

Mitchell sits uneasily with, and is often highly critical of these approaches and yet interestingly does not break fully from any of them. He is certainly critical of Ross's work and the oil-states literature much of which seems to invest Olympian powers in oil itself. Oil in the resource curse view distorts the organic, natural course of development; oil wealth ushers in a bloated economy of hyper-consumption and spectacular excess: decadent shopping malls in Dubai or flagrantly corrupt Russian 'oilygarchs'. The danger in all of this sort of oil talk is that there is a slippage between oil as a commodity of indisputable political, economic and cultural significance and what one might call commodity determinism. Yet Mitchell in his account of how oil shapes democracy, how oil - the language here is instructive – enables, shapes, and makes democracy seems to come very close this Olympian view. Mitchell is no Malthusian for sure; indeed he regularly asserts how the power of Big Oil, often working in tense relations with imperial or colonial states, is in the business of actively not producing oil, or limiting exploration and well-construction, and of managing output to avoid the problems of uncoordinated surpluses. But large sections of his book walk us through the political economy of Middle East oil and it resembles (how could it not?) Klare's vision of the ugly disorder, violence and political machinations along the oil frontier (even if he admits *contra* Klare that neither oil nor capitalism entirely get it their own way). Mitchell is obviously much closer to the oil as a way of life argument, not however through consumption per se but through forms of calculation and expertise – economics in particular but also what passes as democracy in the advanced capitalist states – that attend the shift from coal to oil as the fuel of modernity. But here too oil seems to possess extraordinary powers in the invention of "the economy" in the 1920s, the Hayekian revolution, and much else. All of this pushes the bounds of plausibility. Oil says Imre Szeman (2007: 819) is hardly incidental to capital or to modernity but "that is not the same as saying it is a prime mover of all decision making".

What then is the core of Mitchell's argument? The central claim –though, it must be said, this is a vast and sprawling book covering an enormous territory and I cannot hope to do justice to its nuances and insights – is really about the relations between energy, and in the modern era two hydrocarbons (coal and oil), and democracy, and specifically offers a reading of democracy predicated upon the dominance of coal (from the onset of industrial manufacture to the early twentieth century) against the contemporary dependence upon oil and gas (though gas really does not appear as such in Mitchell's account which raises important questions of the sorts he poses about how oil and gas are different). Coal, and the accelerating "supply of energy" (p.14), "enabled new forms of mass politics" according to Mitchell but also had direct implications for territory – and colonialism – from which the required industrial and other materials were supplied. Colonial arrangements were secured through solar-based activities that ensured the supply of agro-foods for industrial working classes – what Mitchell calls "the first set of connections between fossil fuels and democracy" (p.17). Coal made possible urban concentration and dense settlement upon which new democratizing forces depended but also created an "architecture of energy supply" (p.19) which "produced democracy at some sites and colonial domination at others" (p.18). Specifically in the core, coal was used to assemble "political agency" through the ability to slow or disrupt energy supply. Coal workers were important because carbon connected the mines to every home, office and form of transport (p.21). The key words in Mitchell's account are sabotage and the autonomy of the workface. It was the power of the coal workers and the "vulnerability" of the system that produced and enabled – Mitchell uses a variety of terms to describe this relationship – democracy. In turn, the post-1945 period is entirely shaped by the need to confront the release of these democratic powers: to manage labor, to integrate the European coal industry, and ultimately break the power of mineworkers by shifting to oil (p.29).

Carbon Democracy begins and ends with the epistemological question I began with: at the end he reflects upon the differing rationalities and forms of practical calculation pertaining to reserves and recoverable oil and at the beginning with why it is that so many of those who write about oil pass over the guts of the industry itself. Mitchell properly notes (2012:2), that explanations of oil inadequately address the apparatuses by which oil is converted into forms of affluence and influence. Often, he says, oil is portrayed as an affliction of governments who deploy petro-dollars, "not of the processes by which a wider world obtains the energy that drives its materials and technical life" (ibid.). Mitchell (2012:2) claims that the structure of the oil industry is ignored at great cost because precisely because it becomes a sort of abstraction – it can be copied from place to place in a modular fashion – in contradistinction to the notion that political, economic and social relations are in fact "engineered out of the flows of energy" (op cit., p.5). This fabrication is place and time specific because oil is always 'discovered' in space-time (say, Spindletop, Texas, January 10th 1901), and subsequently inserted into a very specific localized (if more or less globalised) political economy even if the properties of the wider oil assemblage are in some sense normalized. This insertion process is never just a reflection of a political or economic order developed *de novo* by Big Oil but the outcome of complex accommodations, compromises, complicities, oppositions and violence. As Mitchell puts it in regard to the Middle East, the oil industry was "obliged to collaborate with other political forces, social energies, forms of violence and powers of attachment" (2012:230). As Neruda's great poem says, the trail of oil leads to the engineer, the title deed and the customs house.

Mitchell offers, in one respect, a straightforward class analysis (this is my language not his) rooted in the strategic powers of some sectors – what I would call 'provisioning systems' like food, energy, transportation, housing – to disrupt and sabotage with wide-ranging consequences. Naturally this raises many questions. Why were mine workers so militant? Were they equally militant and disruptive across capitalist states (and if not, why not)? Why are miners more important to democracy than other class struggles? What is it about the labor process – he does not deploy this term – that makes for the relationship between work and strike activity? What about states in which coal continues to play a dominant role? And not least, oil has never displaced coal in the capitalist states – coal remains hugely important in electricity generation – so what exactly are the relations between two different hydro-carbons and their simultaneously and contradictory consequences for democracy? There also seems to be a question of timing in this part of the story. The fact is that coal militancy is not only varied across space but seems to arrive (in the US case for example) relatively late in relation to the actual formation of what he call democratic potential – and curiously the militancy within the petro-chemical industry in the US is significantly underplayed.

None of this is to suggest that those resources upon which capitalism depends – food for workers, energy for industry – must not be explored in relationship to the sorts of questions Mitchell asks. And clearly coal plays a role. But curiously democracy comes close to only being a carbon story and the seemingly causal powers invested in hydro-carbons seems to be vast. The fact that an argument is being sustained across long periods of time and large parts of the capitalist world makes the argument even more problematic – or at the very least seems to ride roughshod over the things that Mitchell seems especially concerned with (place, context, temporality).

The advent of oil and the fact it is a fluid and relatively light and readily transportable – and geographically constrained in its distribution especially outside of the industrialized states – created not simply a new energy architecture but new relations between colony and metropole and a new landscape for democratic potentials (pp.37-39). Coal produced a "dendritic network" with choke points, but oil flowed along networks where there is more than one path and flows can be switched to avoid blockages (p.28). The challenge for oil companies was then to control conduits, bottlenecks and "restrict rival channels beginning with oil wells" (p.40). The result was government quotas, price controls and cartels. A cartelization strategy was supplemented by two others: national security which enabled the US to pay oil-states to *not* produce, and to construct a lifestyle around the massive and profligate consumption of "cheap energy" (p.41). Oil workers were isolated at the end of the network and had limited powers; the companies conversely were in the business of producing scarcity, of limiting output as best they could subject to the fact that they were "never strong enough to monopolise the flow" (p.45). Again this poses more questions that it answers. Is the history of oil workers so isolated and marginal (and petro-chemical workers in particular)? Mitchell claims that the oil conventional oil narrative is "misunderstood" because it focuses on companies not workers, is a narrative about controlling and limiting output (not the laws of the market), and because it exaggerates the power of international oil companies (IOCs). Yet, his own narrative, at least until we arrive at his account of Islam and oil, invests enormous controlling powers in Big Oil and seems to marginalize the powers of oil workers. The fact that the manufacture of scarcity is key and that oil depends upon the military and finance capital is surely well documented and has been since at least the 1970s.

Mitchell does document in important ways the extent to which oil in the Middle East was less about "heroic prospectors" and more about "delaying [oilfield] development" (p.54). He is, in my read, more original in his exploration of how in pursuing these goals the oil companies simultaneously portrayed themselves as serving the imperial interest and contributing to national well-being and self-determination. In two powerful chapters (three and four), Mitchell walks the reader through the inter-war period in the Middle East addressing how oil interests had to confront resistance to colonialism and increasingly assertive nationalism. Oil assisted in the translation of democracy into self-determination – a weakening and dilution of coal-based democracy – and a sort of democracy-light (p.85).

In the middle of *Carbon Democracy*, Mitchell sustains at least two important arguments associated with the Marshall Plan which he sees as engineering a political and financial setup less vulnerable to democratic agency by "making Europe increasingly dependent on oil and the dollar" (p.122). The new architecture as based on controlling Middle East oil and trading oil in dollars. Here Mitchell makes some striking claims. First, that low-cost oil assembled "the economy" (a self-contained structure of relations of production, distribution and consumption in a given space), an object referent that did not exist until the 1930s. Relatedly Keynesianism was a form of "petro-knowledge", a form of calculation derived from cheap oil in which the economy was a process of monetary circulation that "could expand without betting physically bigger" (p.139). The calculus surrounding a seemingly inexhaustible supply of non-renewable resources made possible the notion of "growth without limits". Not only was oil weakening the left in Europe and elsewhere, it "made possible" Bretton Woods, the economy as the "central object in democratic politics in the West" (p.125), the Cold War and neoliberalism (p.141). The backdrop for these developments was the struggle to maintain control of Middle Eastern oil amidst the establishment of OPEC, a process of controlling oil and finance in new ways that "was completed in the 1973-74 crisis" (p. 171).

It is impossible here to fully engage with these claims which, I have no doubt, will be a source of debate for some time. How much of the Mt Pelerin Society can be plausibly related to oil is surely an open question, and Mitchell's account of neoliberalism does not sit well with the genealogical work on neoliberalism and Hayek by the likes of Michel Foucault, or Philip Mirowski or Jaime Peck. If one is to try and square Margaret Schabas (2005) account of "the natural origins of economics" and the emergence of the economy in the late eighteenth century one can only say that Mitchell must have an exceptionally narrow set of meanings for the economy that emerged in the 1930s. He points to discourses of the national economy and of the forms of calculations and data collections as markets of something distinctively new an argument he made in his earlier book *The Rule of Experts* which was utterly unrelated to oil. Either way I do not find this argument compelling.

In two final chapters Mitchell takes on the crisis of the 1970s. He asks the question: what work did it take to construe 1973-74 as an illustration of the laws of the marketplace and how was a complex series of social, economic and political trans formations brought together in the US as "the energy crisis". The argument here is very complex indeed, and a little baggy. One aspect concerns how in opposition to the limits to growth ideology, economists construed the energy shortage as a fiction and reinvented resource economics around the free market. Another was the White House construal of the energy crisis as a political object and how OPEC price increases dealt with petrodollar surpluses created in the Middle East (here Mitchell makes good use of the pathbreaking work by Nizan and Bichler (2002) and Bob Vitali'ss excellent book on Saudi Arabia, *America's Kingdom* (2007). He depicts brilliantly how demands by oil workers and pockets of resistance were channeled into programs for nationalization (here is the connection with the NOC story contained in *Oil and Governance*) while production cartels could restrict supply simultaneously guaranteeing corporate profits and the creation of a strategic resource requiring "imperial armies and vassal states" (p. 237). A final argument relates to how the oil companies used the energy crisis as a way of deflecting pressures from the costs of oil spills and other externalities to the dangers of nuclear power. Overall the vast array of conflict, confrontation and rivalries transformed oil networks into a "political instrument" (p.198) serving two purposes: the redirection of oil profits (weapons, petro-dollar investment) and the Palestine question (the efforts to prevent a settlement relied Mitchell argues on market mechanisms). I cannot possibly hope to do justice to often exciting and provocative claims made in this chapter which, on my reading, is exploding at the seams with details, arguments and developments which seem to be heading off in wildly different directions.

In the final substantive chapter Mitchell takes on the question of oil and Islam. His primary argument is that empire and the powers of capital can exist only by drawing on social forces that embody other energies – the *muwahhidun* being a case in point. In an argument he has made previously, Mitchell provides an utterly compelling account of how Big Oil was never able to create a political order on its own for its own purposes. Various forces were available across the Middle East and organized Islam was one which had its own purposes and dynamics and could, in the context of oil profits, arms and corrupt comprador classes, provide a non-secular alternative capable of undercutting the "political control of Arabia" that Big Oil (and imperials states) required. All of this is explained brilliantly though I should say that the notion of examining the weaknesses of imperial and corporate powers has been a staple of postcolonial theory for some time. What is less clear is how first how this claim stands up against other parts of the book in which imperial and corporate powers seems absolutely Olympian capable of dictating and controlling the great cranking gears of history. And second, Mitchell concludes that the Islamism story in relation to oil describes a "deficiency of capitalism", that capitalism has no logic (p.230), and that the political violence of the US is a "persistent symptom of this absence" (p.230). I simply have no idea how one might reach this conclusion from reading what Mitchell has to say about Islam and oil, and the entire narrative of his book. To claim that capital cannot fully secure and determine the political conditions of its operations is one thing; to say capitalism has no logic and that imperial violence indicates an absence of the logic of capitalism leaves me scratching my head.

Carbon Democracy makes for gripping, and sometimes frustrating reading. The purported relations between hydrocarbons and democracy are extremely interesting and important but it is often difficult, given the scope and ambition of the book, to disentangle what can plausibly be traced to oil or coal and what is really the result of other powerful forces. As a result Mitchell seems to overreach sometimes by selling short what we already know about the oil complex and sometimes by pushing the argument too far (the invention of the economy and of neoliberalism). Mitchell makes the point (p.253) that oil does not "determine everything else", but the capacious powers of the oil network he documents, on my read, comes very close to suggesting otherwise. He leaves the reader, however, convinced that oil in our own era has been a powerful resource to think and calculate with, in and around which powerful forms of expertise has arisen, most obviously in economics. There is much more to be said here not least in the armies of consultants and oil experts with their forecasting models (Cambridge Energy Associates, IHS Energy, the Baker Institute) to say nothing of the oil men who Mitchell mentions with deep politics and their own think tanks and political action committees. Mitchell leaves us with the thought that contemporary neoliberal economics has dematerialized and denaturalized the world of economic flows – this is a point made by Schaba 9005) too. From this de-natured politics flows all manner of mischief and deception.

Oil and Governance, the excellent edited collection by David Victor, David Hults and Mark Thurber takes on the panoply of actors that operate under the broad sign of national oil companies, the hugely powerful and assertive entities (and enormously heterogeneous in almost every way) that have aggressively imposed themselves upstream and downstream in the global 'value chain'. A new international division of labor reigns in the global oil industry – its origins of course lie in the 1970s - in which the oil super-majors control an insignificant proportion of reserves and increasing focus on downstream business as their major profit center – while continuing to push for oil in high risk frontier areas (the conflicted Caspian or eastern Siberia, or in 8000 feet of water in Brazil). It is somewhat odd that these new behemoths do not appear in Mitchell's narrative in any sustained or systematic way in particular because their role is so important if one is to take seriously his argument about the limits of capital and capitalism. In regard to the NOCs, the supermajors find themselves in a tight slot. The end of 'easy oil' – meaning both the increasing nationalization of reserves and the technological challenges of deepwater and unconventional oil and gas in more amenable political environments – places the majors in a situation in which their refining capability is not well situated geographically to feed the burgeoning Asian markets. Aggressive national oil companies are also making themselves felt in the refining business (often through mergers and acquisitions) as much as exploration and production. There is irony and truth in equal measure in the claims by the majors that they are increasingly unable to meet the demands of reserves replacement due to resource nationalism in oil-producing states, and often unable to acquire acreage in bidding rounds in which – to take one example – Chinese mercantilism can offer resources that no Exxon or Shell could possibly match. The fact that Asian oil companies are now cutting direct deals with oil producers (so-called 'loans for oil') through bilateral exchanges means that these extra-market transactions further compromises the power of the majors.

Oil and Governance makes clear that the NOc story is also about the rise of enormously powerful new oil and gas companies a number of which are in fact strange hybrids: state-owned with a proportion of their equity publicly traded (see Labben 2008). PETROBAS, Rosneft, Lukoil, CNPC to say nothing of South Korean and Malaysian companies are changing the landscape as much as the OPEC cartel and Third World nationalism revolutionized the operating environment of the (old) Seven Sisters. Oil and Governance recognizes and indeed wants to explain why all NOCs are not alike: some are vertically integrated and are net oil exporters (Saudi Aramco), others have limited domestic oil equity and are significant oil importers (the Korean National Oil Company). Both forms, however, represent what have been dubbed the 'new titans', reshaping the political economy of oil. In 2010 Asian NOCs, for example, spent over $15 billion in oil assets in North and South America actively courting mergers and acquisitions. One of the implications of the growth of nationalist oil-regimes and aggressive integrated nationalized companies is the variety of organizational and governance forms in which transnational oil majors are now involved. These governance archetypes encompass quite different equity arrangements, contractual commitments, forms of joint venture partnership and operatorship, all involving complex business arrangements between several different sorts national, hybrid and private oil companies. One of the great strengths of *Oil and Governance* is the richness of fifteen case studies which, even in the face of limited data and access, exposes the different sorts of "performance" rooted, as the editors see it, in state-NOC relations. The book distinguishes itself not by focusing on the relations between political regimes and oil governance as such (Soares de Oliveira 2005) but by examining what managers do, how and if expertise is constructed, the degree to which rents are privatized and so on.

It is almost impossible to summarise or capture the richness of the contributions to *Oil and Governance*. Suffice to say that the structure of the book examines the twin questions of NOC performance and strategy. The strategic choices are mapped as: operatorship, resources (new frontiers or easy oil), geography (a domestic versus a global strategy) and political (how and if the NOC creates "political assets" to operate and pursue its core mission). The editors' model (p.21) sees strategic choices emerging from an array of governance configurations that currently dominate the oil and gas landscape, namely a variety of joint venture and production share arrangements that link governments, NOC, and IOCs and service companies in a wide array of norms and forms of organization (I would also include here finance capital but banking and financial services are surprisingly excluded form the study). These configurations in turn are the products of “state goal”, “state institutions” and the “nature of the resource” (geology). The later, in their account, turns out to be of little significance – it is a “sorting mechanism” (p.905) but does not account for why some NOCs invest in capabilities and strategic relations and others do not. It is, in short a state centric account in which, as Hults in his chapter suggests, governance and performance are positively related to “state unified control” over companies, heavy monitoring and oversight, and “law based mechanisms”. Performance and strategy question turn on State-NOC relations which the editors suggests points to two fundamental analytical frames: what they call the administration of rents (predictable or contestable), and state goals (public goods versus private goods). Predictability and commitments to public goals produces “good governance” (Statoil/Norway) and with private goals generates “unified petro-states” (Petronas/Malaysia), while highly contested rent distribution and private goals produces “the resource curse” (NNPC/Nigeria) and with public goods produces “hybrid economies” (Mexico/PEMEX).

Whether *Oil and Governance* represents, as the editors wish, the power of social science to explain NOC heterogeneity is, I think, an open question. Obviously each of the key axes speaks directly to politics and the operations of power in (often) post-colonial states which is in fact the volume’s weak reed. In this sense the sort of analysis by Ricardo Soares de Oliveira (2005) on the Gulf of Guinea oil states has a sort of dynamic and historicized analysis and a sensitivity to the operations of power that *Oil in Governance* does not possess. That said, and oddly in light of what the editors say about not wanting to simply produce fifteen detailed histories of different NOCs, the strength of the book resides in the wealth of materials in each case, and the sorts of dramatically different national dynamics and trajectories that shape the development of each NOC - growing out of a particular moment (history) and context (political economy). It is surely a story of the state and its institutions but oil, upon the discovery of commercial plays, is always inserted into a ready-existing national (and globalized) site. For example, the fascinating history of Statoil and how it grew on the backs of a declining maritime industry – and driven by the geological and offshore conditions in which it had to operate - rooted in Norwegian social democracy is exceptionally compelling. Equally reading the case of Angola (in which SONANGOL has grown under the auspices of an authoritarian centralized party into a massive sort of vertically and horizontally integrated *chaebol* with interests across virtually all sectors of the economy, with deep links to China and to the Dos Santos party-state while building a protected technological capability during thirty years of civil war) against Nigeria – (the very worst of nationalist gun-slinging and robust privatization growing out of a multi-ethnic federal system in which fiscal federalism assumes the forms of internecine war) is exceptionally rewarding. Indeed there is much to be learned – and even more to be theorized – from these remarkable case studies.

Thomas Pynchon in his extraordinary novel *Gravity's Rainbow* writes, among other things, of the complex world of carbon chemistry as at once natural, material, symbolic, political and spectacular. It is a tall order to undertake such a task for the contemporary world of oil and gas. Mitchell's pathbreaking book has the ambition to take this on and open up new vistas for all of us interested in the hydro-carbon universe. *Oil and Governance* offers a more truncated and attenuated account of admittedly what stands now at the heart of the global oil and gas business. But a careful read of these cases almost inevitably leads us into that multi-dimensional world – and the paranoia and madness too – of Pynchon's panoptic novel.

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